Indonesian Journal of Electrical Engineering and Computer Science
Vol. 8, No. 2, November 2017, pp. 555 ~ 556
DOI: 10.11591/ijeecs.v8.i2.pp555-556

Best Communication Node Election for Well-Organized Path in Flat Topology

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Abstract

There has been an increasing attentiveness in the uses of sensor networks. Because sensors are normally controlled in on-board power supply, proficient supervision of the network is essential in improving the life of the sensor. The majority research protocols objective at offering link breakage reducing and mitigating from the same. Yet, selecting the well-organized communication do all the beneficial to the transmission process thus demonstrating better improvement in the network performance. In this article, we propose Best Communication Node Election for well-organized Path in Flat Topology The main goal of this work is to choose the best data transmission node in flat topology for improve the multi hop routing. This scheme, the best communication node selection based on Path Metric and this Path Metric is measured by the packet obtained rate, dropped rate, latency rate and node energy. This scheme provide guarantees quality of Service in the network.

Keywords*: Wireless Sensor Network, Received Signal Strength, Quality of Service*

1. Methods and Materials

Wireless Sensor Networks (WSNs) play a vital role in today's real world applications. In a typical WSN, sensor nodes are used for sensing, transmitting, and data processing. Sensor nodes can be used in many industrial, agricultural applications, military such as environmental monitoring, traffic monitoring, transportation, battlefield surveillance, and smart offices. The design of energy efficient protocols for WSNs is an important issue in most applications where the deployed motes are powered by batteries that cannot be easily recharged.

PEGASIS: Power-efficient Gathering in Sensor Information System in this paper explained by [1] Power-efficient Gathering in Sensor Information System [1] was focused on reduce the delay during sensor transmit the data to BS. In PEGASIS avoid collisions among the sensors also it reduces the data overhead. Energy-aware routing introduced different hierarchical routing algorithm for cluster-based WSNs. In this scheme, the groups of sensor nodes are formed clusters and the CH is acting as a gateway that gathering sensors information. A Time Divisible Multiple Access based Multiple Access Control is used for sensor to send information to the CH. The CH communicates each node regarding slots in that it should watch to other sensor communication and slots, that the node can use for its own communication.

The sensor node operations are sensing, data transmission, sensing-relaying, and inactive. In sensing phase, the sensor nodes are sensing the environment. In data communication phase, the sensor node are communicates the data to CH or other sensor. Finally, the sensor node is considered as a inactive and it can turn off its sensing and data communication. Energy-aware routing approach Energy-aware routing in cluster-based sensor networks in this paper explained by [2] is used to preserve the energy in WSN network. In this scheme, the gateway node acts as a centralized network manager. The gateway is set the routes for sensor data as well as observes the latency.

Data Gathering algorithm based on Mobile Agent (DGMA) A data gathering algorithm based on mobile agent and emergent event-driven in cluster-based WSN' in this paper explained by [3] was introduced the concept for reduce the delay in WSN. In this scheme, every cluster maintain a mobile agent, which is used to collect every cluster member sensed data. Then the Mobile agent send the collected information to CH and CH is finally communicate the data to BS. Distributed Clustering Scheme based Spatial Correlation (DCSSC) Towards a Distributed Clustering Scheme Based on Spatial Correlation in WSN in this paper explained

Received June 29, 2017; Revised September 1, 2017; Accepted September 17, 2017

by [4] for reading the sensor similarity data. In this scheme, the highest similarity observations are formed the cluster, they can report their sensed data for energy saving.

Hierarchical Geographic Multicast Routing (HGMR) Hierarchical geographic multicast routing for wireless sensor networks in this paper explained by [5] proposed for enhancing data transmission effectiveness and increasing the scalability in the network. HGMR introduced Geographic Multicast Routing (GMR) for transmit the data multiple destination at a time. Hierarchical Rendezvous Point Multicast (HRPM) that multicast group into subgroup of controllable size using HRPM's key concept of mobile geographic hashing. HGMR elect the data communication route provide energy-efficient and scalable. However, the RP is in cost is higher in HGMR that introduced the problem of quick energy utilization also it create the entire network collapse.

2. Best Communication Node Election for well-organized Path in Flat Topology

In this technique, the communication node decides the Received Signal Strength for a Route Request message sent by the sender node and then floods the message. Likewise, the Route Reply message from the receiver sends the node's significant path parameters such as data obtained rate, dropped rate, latency rates and energy estimated as a single Path Metric (PM) for the getting nodes forward direction of the sender measure by Equation (1).

$$PM(n) = OR(n) + E(n) + \frac{1}{DR(n)} + \frac{1}{LR(n)} \quad (1)$$

OR(n) → obtained rate of the sensor node *n*
DR(n) → Drop rate of the sensor node *n*
LR(n) → Latency rate of the sensor node *n*
E(n) → Latency rate of the sensor node *n*

The routes with the best PM(n) and less distance sensor nodes are added as a route and sent to the sender anywhere the data wants to be sent to the receiver. This is aimed to progress the performance of the network.

3. Conclusion

Due to the insufficient energy and communication capability of sensor nodes, it seems mostly important to proposed Best Communication Node Election for well-organized Path in Flat Topology Method in WSNs. In this scheme, the communication node is elected according to the path metric. The Path Metric is measured by the packet obtained rate, dropped rate, latency rate and node energy. This scheme gets better communication node selection and solves the energy-dried problem due to energy.

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